Refrigerated Cabinet with Rolling Night Blind

The invention relates to a refrigerated cabinet comprising at least one goods compartment opening adapted to be closed by a rolling night blind, such as e.g. a refrigerated (freezer) chest or a refrigerated (freezer) shelf cabinet, in which the rolling night blind(s) is/are held in a rolled-up state in their inoperative position.

In a multiplicity of goods display or refrigerated cabinets, the goods compartment openings are closed by means of one or more rolling night blinds during shop closing times in order to save energy. Depending on the type of refrigerated cabinet or furniture, the rolling night blinds are stored in different portions of the refrigerated furniture during shop opening times. In case of a refrigerated chest or island, such storage preferably takes place in the rear wall portion or central partition of the refrigerated chest or island, whereas in case of refrigerated shelf cabinets, the night blinds are stored in the top region.

For the purpose of closing the goods compartment opening(s), the night blinds are unrolled in front of the goods compartment openings. Materials used for rolling night blinds are films/foils, fabric etc.

The prior art as well as the disadvantages involved by the same will be elucidated in more detail hereinafter in exemplary manner by way of a refrigerated shelf cabinet. However, it will be obvious to the expert that the disadvantages mentioned are equally present in all known types of refrigerated cabinets in identical or at least similar manner.

To prevent warmer ambient air from penetrating the goods compartment of a refrigerated shelf cabinet, a curtain of cooling air is generated along the opening of the goods compartment. This curtain may be single- or multi-

layered. In case of conventional refrigerated shelf cabinets with rolling night blinds, there are as a rule gaps left between the night blind(s) in the covering position thereof and the side walls of the refrigerated shelf cabinet body – with the width of these gaps ranging from 5 to 40 mm. These gaps are due to the supports used so far for rolling night blinds, with these supports permitting the night blind(s) to be guided or arranged in gap–free manner with unreasonably high technical expenditure only, or not at all.

Through these gaps, cold air in the lower portion of the refrigerated shelf cabinet drops from the refrigerated goods compartment. In case of wider refrigerated shelf cabinets as well as in case of several refrigerated shelf cabinets coupled with each other, there are usually employed several juxta–posed rolling night blinds, with a gap remaining between these as well. This outflow of cool air and inflow of warm air leads to a quite considerable and undesired disturbance of the cooling air curtain.

It is the object underlying the present invention to provide a refrigerated cabinet of the type indicated at the outset, in which the disadvantages described hereinbefore are avoided.

This object is met by a refrigerated cabinet according to the generic clause, which is characterized in that the support of the or of at least one rolling night blind has at least one loose bearing.

It is now rendered possible by the invention to integrate rolling night blinds in a refrigerated cabinet in such a manner that the gaps between the night blinds and the refrigerated cabinet side portions and – if several night blinds are used in juxtaposed manner – the gaps between two adjacent night blinds can be avoided. For example, when the invention is realized in a refrigerated shelf cabinet having one rolling night blind only, a supporting structure can be realized in case of support of the night blind solely by means of loose bearings in which there are no more gaps left between the rolling night blind and the refrigerated cabinet side portions.

The invention thus permits to dispense with the lateral rolling night blind supports used so far.

According to a development of the refrigerated cabinet according to the invention, it is suggested to support the or at least one of the rolling night blinds so as to be slidable along the longitudinal axis of its blind carrier shaft.

Support of a rolling night blind so as to be slidable along the longitudinal axis of the blind carrier shaft can be realized easily by way of the afore-mentioned loose bearings.

When the rolling night blinds of the refrigerated cabinets according to the invention are now brought into the position(s) closing the opening(s) of the goods compartment(s), these blinds may subsequently be brought into a (partially) overlapping state – by slidably moving at least one night blind. The effect achieved thereby is that the gaps left between two night blinds each are closed. The possibilities for outflow of cold air and inflow of warm air are thus reduced, and this results in a reduction of the energy required for refrigerating the goods compartment(s).

According to a development of the refrigerated cabinet according to the invention, it is suggested that the rolling night blinds, at least at their adjoining side portions, have means for connecting the same.

These means for connecting the night blinds are preferably in the form of adhesive tape, hook-and-loop-type closure, zip fastener etc.

The refrigerated cabinet according to the invention as well as additional developments thereof will be described in more detail by way of the embodiments illustrated in Figs. 1, 2a and 2b.

Figure 1 schematically illustrates a lateral sectional view of the upper front portion of a refrigerated shelf cabinet 2 serving among other things for supporting or storing a rolling night blind 1 – represented by the roll 3.

According to the invention, the rolling night blind 1 now is supported so as to be slidable along the longitudinal axis of the roller blind shaft 4. As illustrated in Fig. 1, this can be achieved in that the roll 3 now loosely rests on, or is supported by, bearings 5 in a groove–like recess of the refrigerated shelf cabinet portion 2.

The bearings 5 permit rolling up and unrolling of the night blind 1 from its roll 3 and in addition thereto a sliding motion of the roll 3 along the longitudinal axis thereof or the longitudinal axis of the roller blind shaft 4.

To realize the idea according to the invention, it is possible to make use of all bearing possibilities for rolls 3 that permit a sliding motion of the roll(s) 3 along the longitudinal axis of the roller blind shaft 4.

Due to the fact that the night blinds described hereinbefore as a rule are rolled up and unrolled automatically, the drive used for driving the night blind – which usually is an electric motor – either has to be slidable as well or needs to be connected to the roller blind shaft 4 via suitable, length–adjustable devices.

Figure 2a illustrates merely schematically the current prior art in which a gap 6 is left between two unrolled night blinds 1 and 1', through which cold air drops from the refrigerated cabinet interior and warm ambient air enters into the refrigerated cabinet interior. Schematically shown is furthermore the longitu–dinal axis of the roller blind shaft 4.

As shown in **Figure 2b**, either both night blinds 1 and 1' or at least one of the night blinds 1 is now slidably displaceable such that the night blinds 1 and 1' partially overlap after such sliding motion. The gap 6 left before is closed thereby.

The prior art reveals rolling night blinds made of air impermeable materials as well as rolling night blinds formed with perforations substantially across the entire area of the same – what is meant here is the area spanning the opening of the goods compartment to be covered.

In addition thereto, there are known rolling night blinds – e.g. from DE 298 04 329 U1 –in which the perforation is designed such that the perforation in the upper portion of the night blind in the operative or covering position of the same is of larger size than in the lower portion thereof. This differing perforation may be achieved by providing more and/or larger holes in the upper portion.

In case of perforated rolling night blinds, cold air flows out from the refrigerated goods compartment of the refrigerated cabinet via the perforation provided in the lower portion of the night blinds. The amount of air leaving the refrigerated cabinet, however, is compensated by warm ambient air entering the refrigerated goods compartment of the refrigerated cabinet via the perforation provided in the upper portion of the night blind, due to the vacuum pressure arising within the refrigerated cabinet goods compartment.

Perforated night blinds, with regard to the problems of "air exchange between the refrigerated goods compartment and the furniture surroundings" as well as "formation of condensed water", have superior properties as compared to unperforated night blinds; however, it is disadvantageous that the manufacture thereof involves higher costs and that they involve a higher loss of energy than in case of unperforated night blinds. However, in numerous applications the latter undesirably involve the formation of condensed water in the refrigerated goods compartment and in addition thereto have the afore–mentioned problem concerning the inflow of warm ambient air via the lateral gaps.

The applicant has already suggested rolling night blinds which have holes or are perforated in the upper portions thereof only. For many applications, these types of rolling night blinds constitute a good trade–off between unperforated night blinds and night blinds perforated across the entire area thereof.

It is to be emphasized that the idea underlying the invention can be realized with all known types of rolling night blinds.